

SHORT-RANGE REPRODUCTIVE MIGRATIONS OF HAWKSBILL TURTLES IN THE HAWAIIAN ISLANDS AS DETERMINED BY SATELLITE TELEMETRY

Denise M. Ellis¹, George H. Balazs², William G. Gilmartin³, Shawn K. K. Murakawa¹, and Lawrence K. Katahira⁴

¹Joint Institute for Marine and Atmospheric Research, 2570 Dole Street, Honolulu, Hawaii 96822-2396 U.S.A.
Denise.Ellis@noaa.gov

²National Marine Fisheries Service, Southwest Fisheries Science Center, Honolulu Laboratory, 2570 Dole Street, Honolulu, Hawaii 96822-2396 U.S.A.

³Hawaii Wildlife Fund, P.O. Box 70, Volcano, Hawaii 96785 U.S.A.

⁴Hawaii Volcanoes National Park, P.O. Box 52, Hawaii National Park 96718 U.S.A.

Five hawksbill turtles, *Eretmochelys imbricata*, nesting in the Hawaiian Islands during 1995-97 were tracked by satellite using the Argos system. The purpose of this study was to locate resident foraging pastures utilized by the turtles, and to determine the routes taken to reach these sites. The hawksbill is a rare and endangered species in the Hawaiian Islands where it has recently been the focus of increased research and recovery efforts. Nesting is confined to only a few beaches on the islands of Oahu, Molokai, Maui and Hawaii in the southeastern segment of the archipelago. Sightings by ocean users of immature or adult hawksbills are uncommon in marine habitats of the Hawaiian Islands. In contrast, green turtles, *Chelonia mydas*, are numerous and routinely encountered by divers and tour operators promoting the underwater viewing of sea turtles.

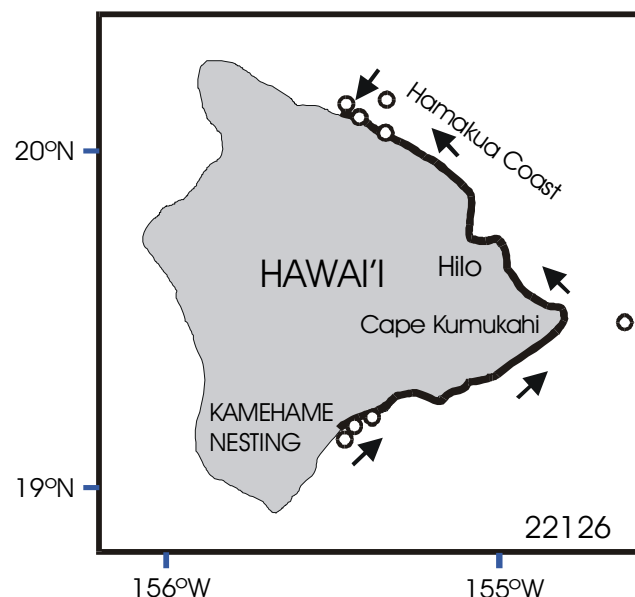


Figure 1. 1995 post-nesting migration of Hawksbill 22126 from Kamehame beach 180 km in a counter-clockwise direction to Honoka'a on the Hamakua coast.

A knowledge of the marine habitats used by Hawaiian hawksbills, especially adult females, is essential for effective protection and management. The flipper tagging of 38 nesting hawksbills since 1991 has only yielded resightings on or near the beaches where the turtles were originally tagged. The Hawaiian Archipelago extends for 2450 km

across the North Pacific (19°N, 155°W to 28°N, 178°W) and is among the most isolated of all island groups. Prior to the satellite tracking reported herein, distant migrations by hawksbills to destinations both within the archipelago, and to international areas beyond, were considered as possibilities.

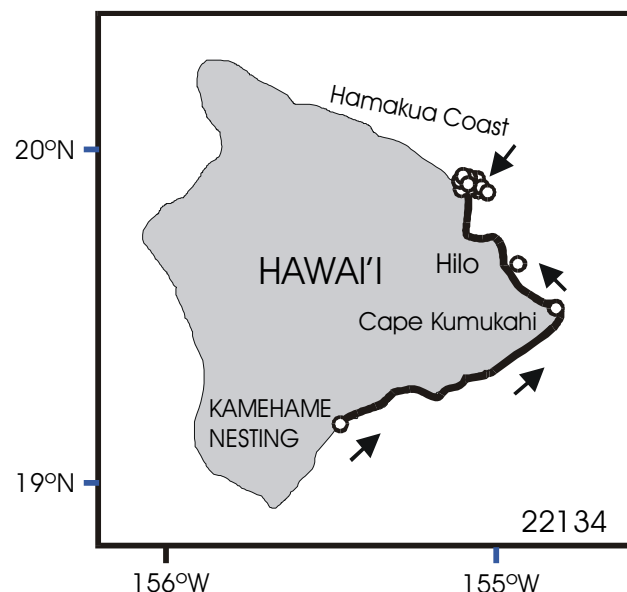


Figure 2. 1995 post-nesting migration of Hawksbill 22134 from Kamehame Beach 135 km in a counter-clockwise direction to Honouliuli on the Hamakua coast.

ST3/ST14 one-watt UHF satellite-linked transmitters made by Telonics (Mesa, Arizona U.S.A.) were safely and securely attached with polyester resin and fiberglass cloth to the carapaces of four hawksbills nesting at Kamehame on the island of Hawaii (two in 8/95, two in 8/96) and one nesting at Kealia, Maui in 9/97. The three turtles tracked in 1996-97 were also equipped with Telonics MOD-225 VHF transmitters to allow auxiliary monitoring using a portable receiver and antenna at nearby coastal sites.

Three of the turtles tracked from Kamehame and the one tracked from Kealia migrated to the nearshore waters of the Hamakua Coast, a windswept shoreline of cliffs on the island of Hawaii that is inhospitable for recreational use (Figures 1-4). The routes taken were mainly coastal involving estimated distances of only 135-255 km traveled in 7-10 days.

The fourth turtle tracked from Kamehame migrated to Kahului Bay on the windward side of Maui, a distance of 315 km (Figure 5). The route of this migration was again mainly along the coastline taking an estimated 18 days.

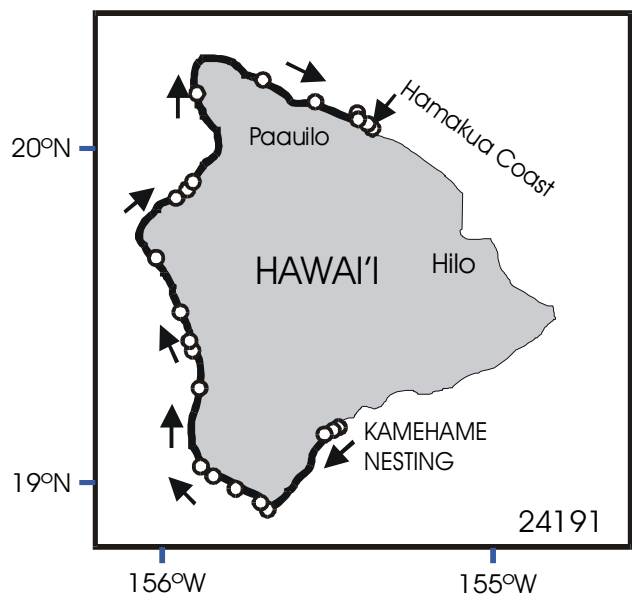


Figure 3. 1996 post-nesting migration of Hawksbill 24191 from Kamehame Beach 255 km in a clockwise direction to Paauilo on the Hamakua Coast.

Upon completion of the post-nesting movements to a coastal area, satellite transmissions continued to confirm each turtle's presence for periods of 71-204 days prior to transmitter signal deterioration. VHF coastal monitoring of the turtle that traveled to Kahului Bay (Figure 5) confirmed its presence there for at least 184 days. Sufficient data were therefore obtained to reasonably presume that foraging areas had been reached where extended residency occurs, possibly until the turtle embarks upon its next reproductive migration.

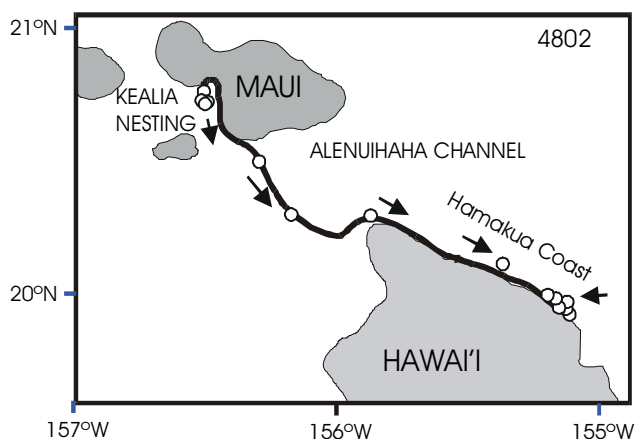


Figure 4. 1997 post-nesting migration of Hawksbill 4802 from Kealia Beach, Maui 240 km to Kuku Point on the Hamakua Coast of the Island of Hawaii.

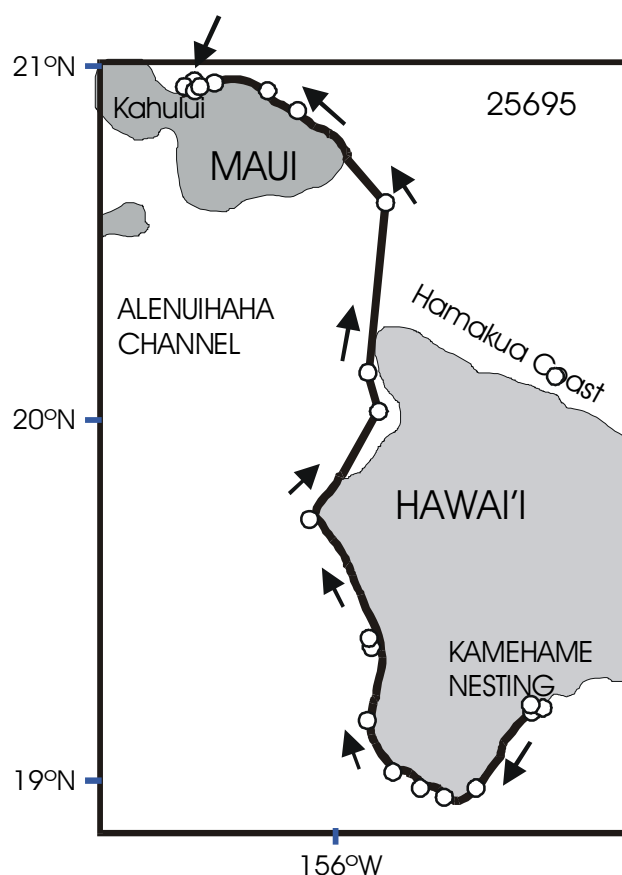


Figure 5. 1996 post-nesting migration of Hawksbill 25695 from Kamehame Beach 315 km Kahului Bay on the Island of Maui.

Results presented in this paper constitute the most successful satellite tracking of hawksbills reported to date. Future research in the Hawaiian Islands will be directed at underwater habitat assessments and censusing of hawksbills in the areas identified by satellite tracking.